IN THE CLAIMS

1. (Currently Amended) An antenna element comprising:

a ground plane;

a cylindrical helix having a uniform pitch, the cylindrical helix being disposed above the ground plane, the cylindrical helix being connectable to a communications apparatus at a first helix end, the first helix end being located near the ground plane; and

a spiral spiraling inward in a flat configuration towards ~~spiral~~ the axis of the cylindrical helix, the spiral having a first end thereof connected to a second helix end, the second helix end being the opposite end of the cylindrical helix to the first helix end, said ~~lateral~~ spiral thereby terminating the antenna element wherein the axis of the cylindrical helix is substantially perpendicular to the ground plane, and the spiral lies in a flat plane that is substantially perpendicular to the axis of cylindrical helix.

2. - 3. (Canceled)

4. (Previously Presented) An antenna element according to claim 1, further including a tapered transmission line connected between the communications apparatus and the first end of the cylindrical helix located near the ground plane.

14. (Previously Presented) An antenna comprising:

a ground plane;

a plurality of cylindrical helices disposed above the ground plane, each said cylindrical helix being connectable, via a respective feed line of an associated switched element feed network to a communications apparatus, at a respective first helix end located near the ground plane; and

a like plurality of spirals, each spiraling inward in a flat configuration towards the axis of the corresponding one of the plurality of cylindrical helices, said each spiral having a first end thereof connected to a second helix end of the corresponding one of the plurality of cylindrical helices, said lateral spiral thereby terminating the corresponding helix;

wherein the axis of the cylindrical helix is substantially perpendicular to ~~th~~ the ground plane, and the spiral lies in a flat plane that is substantially perpendicular to the axis of the helix.

15. (Previously Presented) An antenna comprising:

a phased array feed network having an equipment feed-line for connection to communication apparatus and a plurality of element feed-lines for connection to a like plurality of cylindrical helix antenna elements, said phased array feed network being adapted to collectively connect said plurality of cylindrical helix antenna elements to the communication apparatus; and

said plurality of cylindrical helix antenna elements according to claim 1, said helix antenna elements being disposed above said ground plane and arranged in a rectangular grid pattern having a first spacing between rows of said rectangular grid pattern and a second spacing between columns of said rectangular grid pattern, each said cylindrical helix antenna element being individually connectable at a respective first helix end located near the ground plane to a respective element feed-line of the phased array feed network to thereby connect to the communications apparatus.

16. (Previously Presented) A method of impedance matching a cylindrical helix antenna element wherein the cylindrical helix antenna element comprises a ground plane, a cylindrical helix having a uniform pitch disposed above the ground plane, the cylindrical helix being connectable to a communications apparatus at a first helix end located near the ground plane, and a spiral spiraling inward in a flat configuration towrds the axis of the cylindrical helix the spiral having a first end thereof connected to a second helix end, said second helix end being the opposite end of the cylindrical helix to the first helix end, said spiral thereby terminating the cylindrical helix antenna, wherein the axis of the cylindrical helix is substantially perpendicular to th ground plane, and the spiral lies in a flat plane that is substantially perpendicular to the axis of the helix, said method comprising the steps of:

adjusting a distance, from the ground plane, of the first helix end located near the ground plane to thereby adjust the impedance of a tapered transmission line formed between the ground plane and a first quarter turn of the cylindrical helix.

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